Abstract for "ICT and Economic Growth – Comparing Developing, Emerging and Developed Countries"

Thomas Niebel (ZEW, Germany)

Several growth accounting studies reveal the important contribution of ICT capital to economic growth as well as substantial sectoral and cross-country heterogeneity (e.g. Inklaar et al. 2005; Timmer et al. 2011). O'Mahony and Vecchi (2005) as well as Dimelis and Papaioannou (2011) show based on dynamic panel data estimations that there is a significant effect of ICT capital on output growth for both the UK and the US. Dahl et al. (2011) confirm these findings for eight European countries using EU KLEMS data (O'Mahony and Timmer, 2009).

However, due to data restrictions, research on the impact of ICT on economic growth was mainly conducted for developed countries. Steinmueller (2001) points out that 'ICTs have the potential to support the development strategy of leapfrogging, i.e. bypassing some of the processes of accumulation of human capabilities and fixed investment in order to narrow the gaps in productivity and output that separate industrialized and developing countries'. Whether this strategy is successful, crucially depends on absorptive capacities of the emerging and developing countries (e.g. Keller 2004; Henry et al. 2009). Therefore, it is not a priori clear, whether the output elasticity of ICT is larger in developing, emerging or developed countries. This is more or less reflected in the existing empirical literature comparing the impact of ICT on economic growth between developed, emerging and developing countries.

Dewan and Kraemer (2000) find a positive effect of the ICT capital stock on GDP growth in developed countries, whereas the ICT coefficient for developing countries is insignificant. The estimation is performed with a panel of 36 countries for the years 1985 to 1993. Papaioannou and Dimelis (2007) show that the impact of the ICT capital stock on labor productivity growth is stronger in developed than in developing countries. Their analysis is based on an Arellano and Bond (1991) panel data estimator applied to a sample of 42 countries for the period 1993 to 2001. Based on the very same data but with a refined econometric approach and the inclusion of foreign direct investment (FDI), Dimelis and Papaioannou (2010) report that the ICT impact is now stronger in developing than in developed countries. Yousefi (2011) uses World Bank data for the period of 2000 to 2006. As in Dewan and Kraemer (2000), the impact of ICT capital investment on output growth for developing countries is, again, insignificant. The paper by Dedrick et al. (2013) has the most comprehensive dataset so far with 45 developing and developed countries for the period 1994 to 2007. They provide econometric evidence for the contribution of ICT to growth for both developing and developed countries. The ambiguous empirical evidence so far might be explained by different analytical approaches and the use of data sets covering different countries and time periods.

My research is based on the Conference Board Total Economy Database (The Conference Board, 2013). This database provides annual data for GDP, ICT and non-ICT capital services as well as labor services for 67 developed, emerging and developing countries. Data on ICT capital services are available, with a very few exceptions, for the period 1990 to 2010. There are 24 developed countries (North America, (Western) Europe, etc.), 23 emerging and 20 developing countries with a total of 1362 observations (subgroups are defined by GDP per capita in year 1995). Due to this richer data set, it is

possible to estimate output elasticities for the three country subgroups based on a reasonable number of observations. For the period 1995 to 2010 I find a significantly positive impact of ICT on output growth for developed countries and with equally positive but smaller coefficients for emerging countries. The ICT coefficients for developing countries are rather small and mostly insignificant. This result changes while considering only the years 2000 to 2010. The ICT coefficients are now significantly positive for almost all econometric specifications and country subgroups (developed, emerging and developing countries), with output elasticities of ICT now higher in emerging than in developed countries.